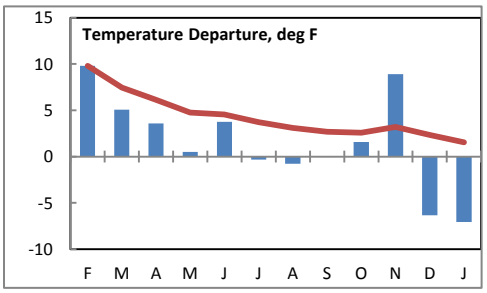
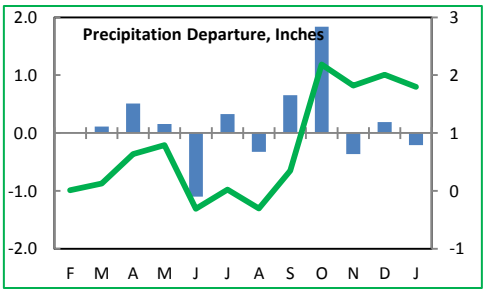
Montana Weather/Precipitation Summary

January 2017 NOAA's National Weather Service Great Falls Montana

A weaker than normal ridge of high pressure was over the west coast during January. This brought a more northwesterly flow to the state, which brought colder air from the northwest. This pattern also contributed to a pattern of intermixed above and below normal precipitation (Fig. 1). January's winds were generally lighter than normal.

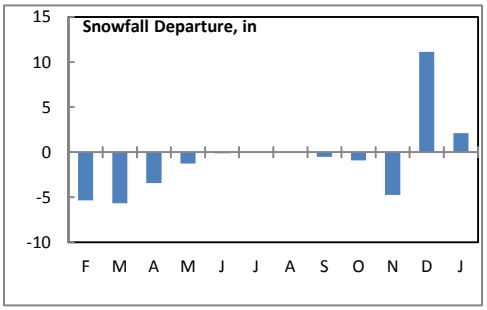
Continuing the trend from December, statewide composite temperatures averaged much below normal for January. The red line on the graph to the right shows the cumulative 12-month departure from normal. The temperature anomalies ranged from normal at Opheim to -14.8°F at Stevensville (Fig. 3). These departures were among the larger in the northern hemisphere (Fig. 2). The warmest average monthly temperature was 25.7°F at Fourmile RAWS (Park) and the coolest was 5.9°F at Red Rock RAWS (Beaverhead). This was the 31th coolest January of record. For the past 12-months, the statewide composite average temperature is 1.6°F above normal. Seven of the last 12 months have had warmer than normal temperatures.

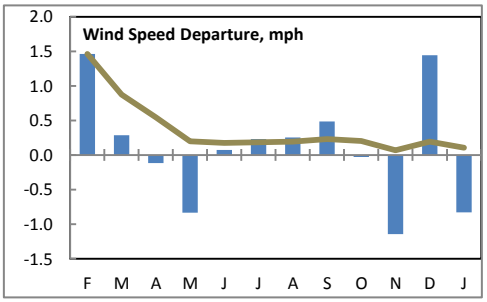




The monthly departure from normal for precipitation across Montana is shown in Figure 4. The wettest areas were in southwest Montana (around West Yellowstone) and the northern Rockies. The highest precipitation amount recorded was 6.50-inches at Black Bear (Gallatin). Elsewhere, 4.51" was reported at Greenough. Statewide, this month averaged 0.57", or 0.21" below normal. The statewide composite precipitation for the past 12 months is 1.80" above normal. The green line on the graph to the right shows the cumulative 12-month departure from normal. Seven of the past 12 months have measured above normal precipitation.

Snow amounts were also variable, however the average snowfall was above normal. The statewide average was 2.1-inches above normal. Mystic Lake reported the largest amount (29.5"), followed by East Glacier (28"). Note how every month of the year had below normal snowfall, except December and January.





The statewide average winds were stronger than normal over eastern Montana. Central and western areas recorded below normal January averages. Statewide, the month ranked as the 16th calmest January of record. The statewide composite average was 8.4 mph, 0.8-mph below normal. The brown line of the wind graph to the right shows the 12-month cumulative statewide wind departure from normal. The 12-month average is running 0.1-mph above average. Seven of the past 12 months have had above normal average speeds. The fastest average speed was 19.0 mph at Deep Creek RAWS (Glacier). At lower elevations, the strongest average was 16.3 mph at Livingston. The strongest wind gust was 86 mph at Deep Creek RAWS on the 16th. On another windy day on the 30th, Browning had a peak gust of 68 mph.

Refer to NEIC's State of the Climate report for the latest monthly discussion:
http://www.ncdc.noaa.gov/sotc/

Jan 1-12
A storm moving through on the 1st brought snow up to a foot over portions of central Montana. Amounts of 6-8" also fell along the eastern tier. Below zero temperatures returned after this storm. Lows in the -20°F range returned by the 3rd. Whiskey Creek reported the lowest temperature in the state for the month on the 5th when they fell to -41°F. Another storm moved through the state on the 8th and 9th. Glasgow recorded 6 inches, Libby 8 inches and the mountains of southern Montana reported about a foot. Windy conditions and much colder air pushed in behind this snow again. Wind chills as low as -53°F were observed at Sunburst on the 11th. Cold air temperatures settled across the hi-line. A location near Havre reported a low temperature of -41°F on the 11th. As the pattern began to change, ground blizzard conditions raged along the northern Rocky Mountain Front on the 12th. US 2 west of Browning was closed a result of these conditions

Dec 13-21
A generally dry and breezy period followed the cold and snow period of early January. The strongest gust of 86 mph was recorded at Deep Creek during this period. Cut Bank also recorded a gust of 55 mph on the 17th. Temperatures were their warmest as well. High temperatures pushed into the lower 60s in central Montana on the 18th. A value of 65°F was reported at Badger Peak (Rosebud) on the 18th.

Dec 22-31
A cold front on ushered in a period of cooler temperatures on the 21st. Although no heavy precipitation fell, there were light amounts across the state. The coldest temperature during this period occurred on the 27th, when Elk Park dropped to -14°F. Windy conditions during the day affected travel. One semi-trailer overturned near Greycliff as a result of the wind gusts. Another storm brought snow to the state on the 31st. Temperatures cooled again as snow amounts as high as a foot fell over portions of southern Montana.

Precipitation/convection

Severe convective weather occurred on 0 days in January, which is normal.

Water-year-to-date summary
The composite statewide average temperature for the year through January was 28.1°F (0.7°F below normal). This was the 49th coolest of record and the coolest since 2011.
The composite precipitation for 2016 was 17.10", or 1.92" above normal. September and October were particularly wet. This was the 25th wettest year of record, and the wettest since 2014.
Composite snowfall was 40.4". This was 13.9" below normal and the lightest fall snowfall since 2004. The year ranked as the 27th lowest annual snow amount.
For winds, the average state wind speed was 9.1-mph, 0.1-mph above normal. This was the 31st calmest year of record, but the windiest since 2000.

January summary information:

High Temperature	65°F at Badger Peak (18th)	**Greatest Precip**	4.51" at Greenough 2NNE
Low Temperature	-41°F at Whiskey Creek (5th) & near Havre (11th)		6.2" at Black Bear (Gallatin)
Warmest Ave Temp	25.7°F at Fourmile RAWS (Park)	**Peak Wind Gust**	86 mph at Deep Creek RAWS (16th)
Coolest Ave Temp	5.9°F at Red Rock RAWS (Beaverhead)		68 mph at Browning (30th)
Range of Temp departures	0.0°F at Opheim to -14.8° at Stevensville	**Highest Ave Wind**	15.2 mph at Two Medicine 19.0 mph at Deep Creek RAWS
21 city mean monthly Temperature/Normal	13.4/20.5F normal. 31st coolest of record (since 1880). 24th percentile.	**20 city mean monthly wind speed/Normal**	8.4 mph/9.2 mph; 16th calmest of record (since 1936). 22nd percentile.
22 city mean monthly precipitation/Normal	0.57"/0.78" – 73% of normal. 29th driest of record (since 1880). 21st percentile.		

Historical Rank of Precipitation (inches)
for the Current Month and Water Year to Date

Location	Jan	% of Norm	Rank	Pcntl	Oct 1 – Jan 31	% of norm	Rank	Pcntl	Years
Baker	0.07	37%			1.06	49%			18
Billings	0.63	78%	36	30	6.19	177%	7	5	115
Belgrade	0.30	59%	43	53	3.63	126%	22	27	80
Butte	0.31	66%	56	45	3.53	150%	25	20	122
Cut Bank	0.50	250%	25	22	2.83	236%	12	10	109
Dillon	0.06	23%	37	47	2.85	178%	5	5	77
Glasgow	0.47	127%	33	27	4.00	208%	6	4	118
Great Falls	0.85	167%	34	26	3.78	151%	24	19	125
Havre	0.69	209%	34	24	4.68	269%	6	4	137
Helena	0.62	172%	40	28	3.60	187%	23	16	138
Jordan	0.56	243%			3.77	209%			18
Kalispell	0.97	73%	77	62	8.20	154%	9	7	122
Lewistown	0.67	118%	42	34	5.07	165%	10	8	121
Livingston	0.44	90%	45	38	5.60	196%	4	3	113
Miles City	0.07	22%	73	52	1.16	60%	105	75	139
Missoula	2.01	236%	17	11	6.65	174%	13	9	136
Mullan Pass	0.53	9%	73	97	18.36	102%	41	54	75
Wolf Point	0.11	35%			1.98	109%			18
Glendive	0.38	106%	40	32	2.26	100%	42	35	118
Sidney	0.90	220%	72	92	2.59	100%	21	27	76
BZN-MSU	0.74	89%	55	39	6.63	142%	12	8	137

Rankings and Percentiles are 1=driest, higher numbers=wetter.
For an automated version of this chart, updated daily, go to
http://www.wrh.noaa.gov/tfx/dx.php?wfo=tfx&type=&loc=products&fx=PCPNTOTALS

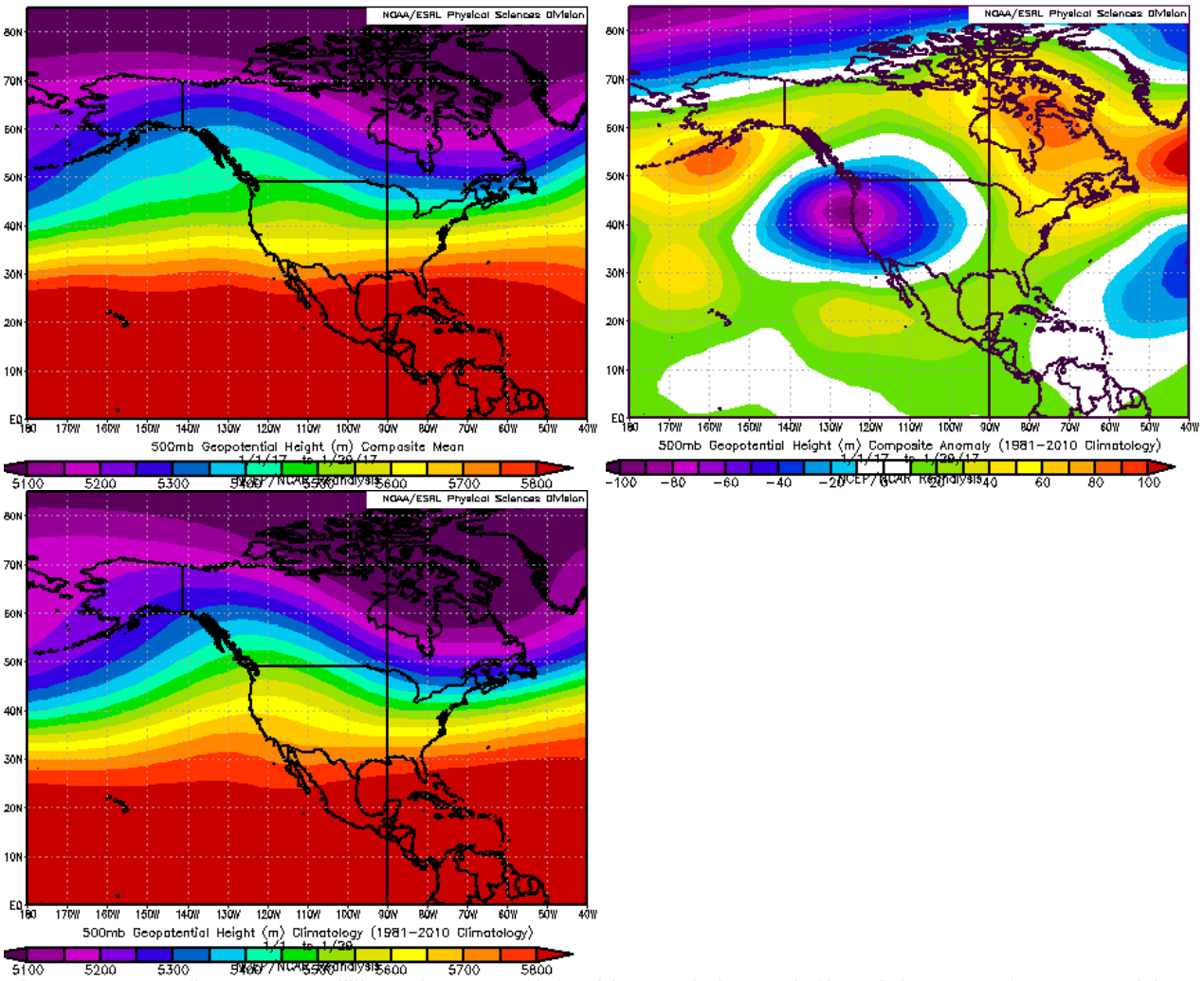


Figure 1. Mean flow at 500 millibars (~18,000 ft) for this month (upper left) and departure from normal (upper right). Average flow at 500 mb for January (lower left).

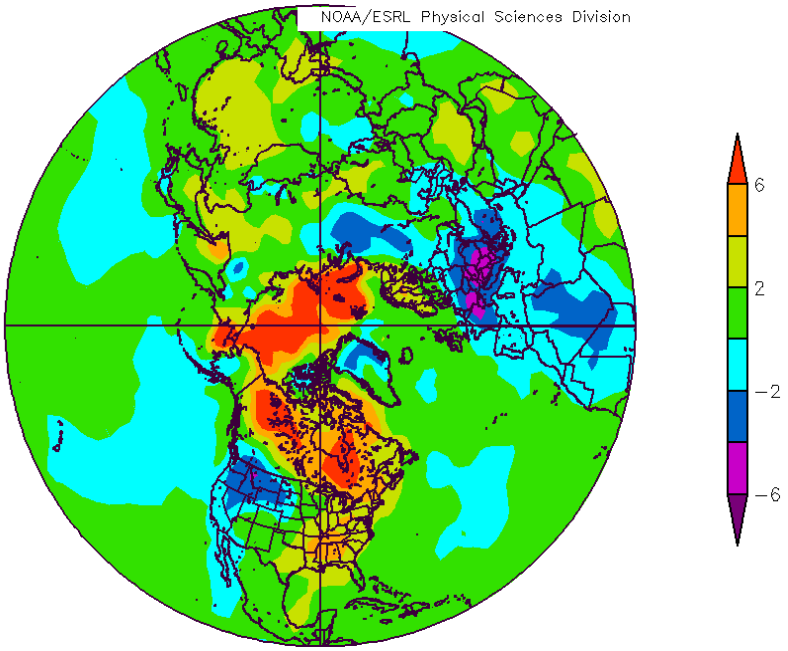


Figure 2. Average January temperature departures from normal. Note the area over western Montana is more than 2°C below normal. The area over northern Europe has departures of 4-6°C below normal.

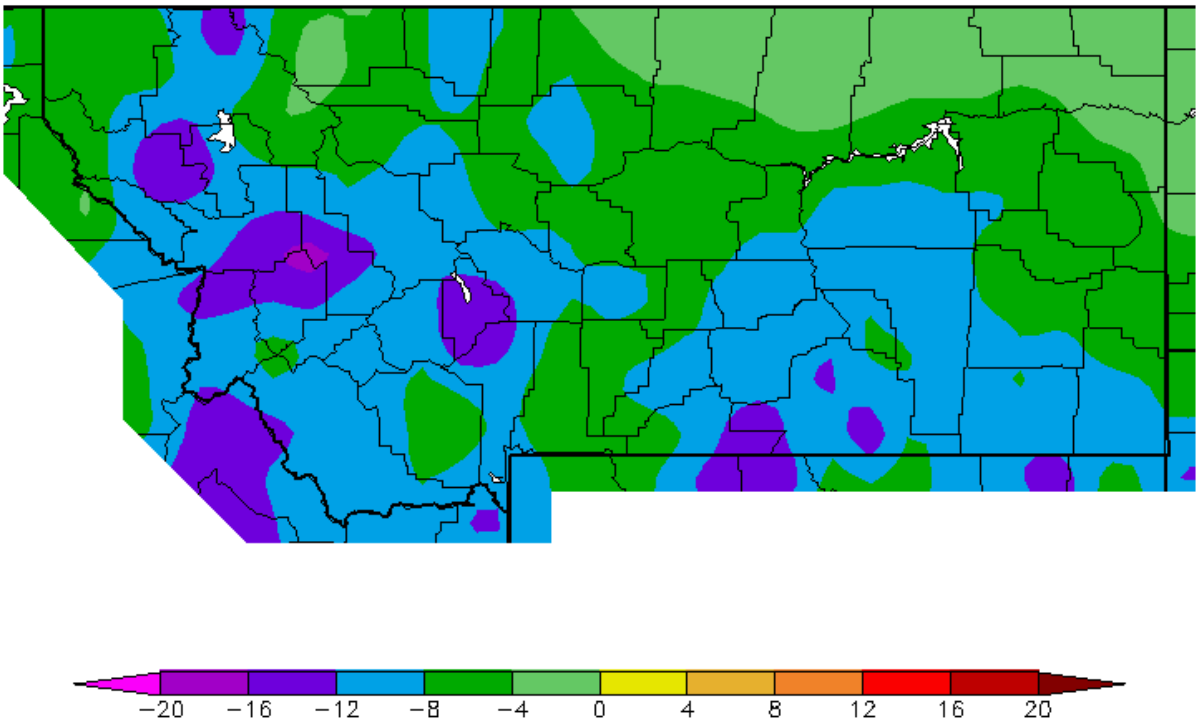


Figure 3. January 2017 temperature departures from normal (°F) (Western Region Climate Center).

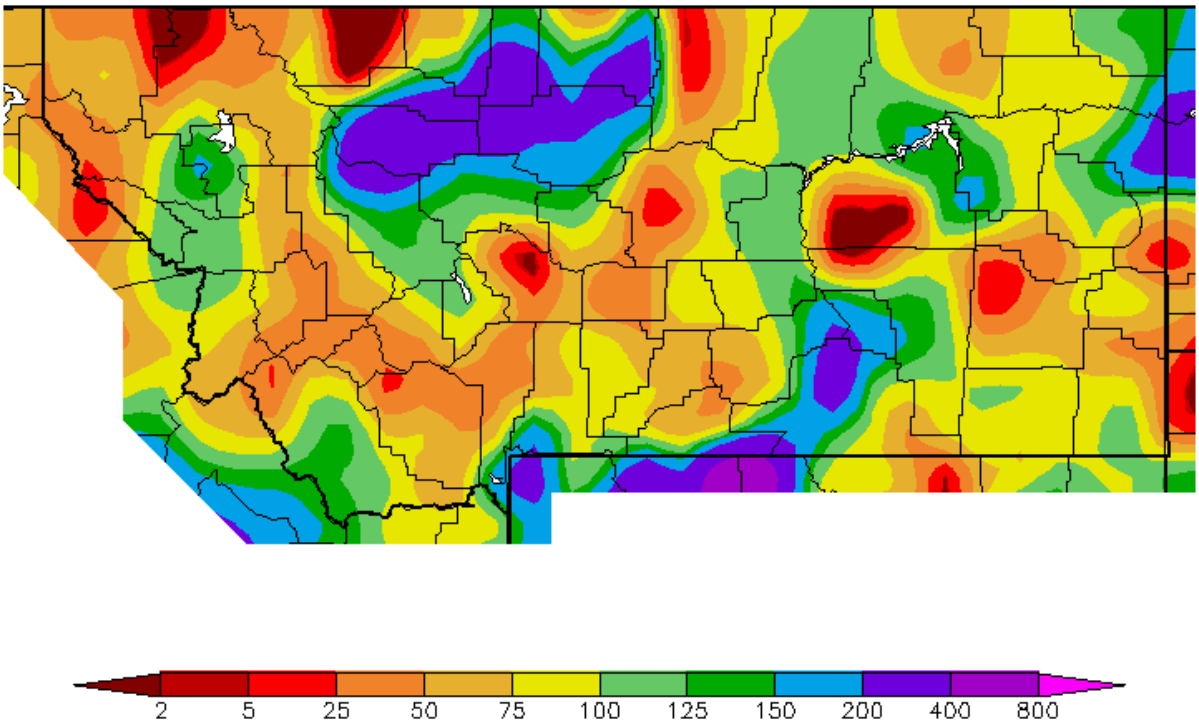


Figure 4. January 2017 precipitation departures from normal (percent) (Western Region Climate Center).

For a state map of % of normal water year precipitation (updated around the 7th of each month), go to: http://www.wrh.noaa.gov/tfx/climate/monthlysum/climatesum.php?wfo=tfx

For the latest information on mountain snowpack from the NRCS, go to: http://www3.wcc.nrcs.usda.gov/snow/index.html

For the latest U.S. Drought Monitor, issued weekly by the National Drought Mitigation Center, USDA and NOAA, go to: http://droughtmonitor.unl.edu/

These data are preliminary and have not undergone final QC by NEIC. Therefore, these data are subject to revision. Final and certified climate data can be access at the National Environmental Information Center (NEIC) http://www.ncdc.noaa.gov. Many more links are on the Drought Information Page of the NWS Great Falls web site at http://www.wrh.noaa.gov/tfx/main/drought.php?wfo=tfx. The climatological record for normals is 1981-2010. The ranking period for temperature, precipitation and snowfall is since 1880. The ranking period for wind speeds is since 1936. The ranking period for soil moisture is since 1995.